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EXAMINER	
STAICOVICI, STEFAN	

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No	Applicant(s)	
	10/074,449	LEBRETON ET AL.	
	Examiner	Art Unit	
	Stefan Staicovici	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 August 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/13/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because the abstract should avoid using phrases that can be implied, such as, "disclosed" (line 2). It is suggested to replace "disclose" with --provided--. Correction is required. See MPEP § 608.01(b).

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: "Method for Manufacturing Fiber Reinforced Thermoplastic Pressure Vessels".

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "124" has been used to designate both a "sidewall preform" (paragraph [0049], line 2) and a cylindrical sidewall preform (paragraph [0049], line 3). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4, 8-19, 21-24, 27-29, 31 are rejected under 35 U.S.C. 102(e) as being anticipated by LeBreton (US Patent No. 6,660,214 B2).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claims 1-2, 27 and 31, LeBreton ('214) teaches the claimed process for making a hollow pressure vessel including, providing a hollow preform made from thermoplastic molding fibers and reinforcing fibers, heating said preform in a rigid mold, installing a plastic liner or rubberized core within the preform, inflating with a gas while the preform is being heated in said mold to fuse the thermoplastic material and form said hollow pressure vessel. Further, (5) LeBreton ('214) teaches that in certain situations it is desirable that the core be partially or completely bonded to the interior of the preform and thus become part of the finished article, hence providing a special interior surface, whereas in other situations the core is removed from the article after the article is cooled (see col. 1, lines 28-48).

In regard to claims 3-4, LeBreton ('214) teaches manufacturing said preform by separately manufacturing a domed portion and an integrated sidewall and bottom portion 9see col. 3, lines 18-21).

Specifically regarding claims 8-12 and 31, LeBreton ('214) teaches that the preform thickness may be constant or it may vary along its length (col. 4, lines 29-34). Further, LeBreton ('214) teaches that the ratio of reinforcing fiber to thermoplastic fiber is constant or may vary along the preform and that optimally it is 3:2 (se col. 3, line 66 through col. 4, line 9).

Regarding claims 13-15 and 21-22, LeBreton ('214) teaches glass fibers having a length of one inch and thermoplastic polypropylene fibers having a length of 2 inches (see col. 3, lines 56-65 and col. 4, lines 24-29).

In regard to claims 16-18, LeBreton ('214) teaches that it is well known to at least partially bond said bladder to said preform by treating said bladder with an adhesive agent (see col. 1, lines 43-48 and col. 4, lines 53-59). Further, LeBreton ('214) specifically teaches that it is well known to at least partially release said bladder to said preform by treating said bladder with a release agent (see col. 1, lines 43-48 and col. 4, lines 53-59).

In regard to claims 19 and 31, LeBreton ('214) teaches a heating temperature of 400 °F or more (col. 5, line 23), a heating time of 30 minutes (col. 1, line 51) and a bladder pressure of 10-80 psi (col. 5, line 14).

Specifically regarding claim 23, LeBreton ('214) teaches thermoplastic powder (col. 3, line 60).

Regarding claim 24, LeBreton ('214) teaches a neoprene bladder (col. 3, line 37).

In regard to claims 28-29, LeBreton ('214) teaches a thermoplastic liner that is pressurized by a fluid (col. 3, lines 43-45).

6. Claims 1-5, 11, 13, 15, 21, 23 and 25-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Murphy *et al.* (US Patent No. 6,171,423 B1).

Regarding claims 1 and 27, Murphy *et al.* ('423) teach the claimed process for manufacturing a hollow reinforced plastic vessel including, providing a rigid mold having a cylindrical sidewall and domed portions, winding a hollow preform having a cylindrical sidewall and domed portions of reinforcing fibers and thermoplastic material, placing said preform against the inner surface of said mold, placing a bladder inside said hollow preform, pressurizing said bladder such as to force said hollow preform against the inner surface of said mold while heating said preform to a temperature sufficient to melt said thermoplastic material and form said hollow reinforced plastic vessel, cooling said hollow reinforced plastic vessel and removing said hollow reinforced plastic vessel from said mold (see col. 7, line 55 through col. 8, line 41). Since pressurization occurs uniformly against the inner surface of said mold, it is submitted that distribution of said fibers is retained throughout said molding process.

Further regarding claims 27-28, Murphy *et al.* ('423) teach a thermoplastic liner (col. 4, lines 58-62).

Regarding claims 2, 25, 26 and 29-30, Murphy *et al.* ('423) teach pressurizing said bladder such as to force said hollow preform against the inner surface of said mold while heating said preform to a temperature sufficient to melt said thermoplastic material and form said hollow reinforced plastic vessel (see col. 7, line 55 through col. 8, line 41). Further, Murphy *et al.* ('423) teach the use of vacuum while pressurizing said preform (see col. 9, lines 10-12). Furthermore,

Murphy *et al.* ('423) teach venting of said mold in order to permit trapped air to escape and hence, to avoid void formation (see col. 6, lines 33-38). It is submitted that voids in the preform are reduced due to the use of vacuum and the fiber distribution throughout said preform is maintained because pressurization occurs uniformly against the inner surface of said mold.

In regard to claims 3-5, Murphy *et al.* ('423) teach an integral hollow preform having a cylindrical sidewall and domed (isotensoid) portions of reinforcing fibers and thermoplastic material. It is submitted that making separable what can be made integral, as Murphy *et al.* ('423) teach, does not appear to provide unexpected results under MPEP 2144.04(V)(C) and as such, by itself does not carry patentable weight. In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961). It is noted that Murphy *et al.* ('423) teach both short reinforcing fibers and long reinforcing fibers that are wound to form said integral hollow preform (see col. 4, line 53 through col. 5, line 18).

Specifically regarding claims 13, 15, 21 and 23, Murphy *et al.* ('423) teach glass fibers and polyethylene fibers to form said reinforcing fiber and thermoplastic material (see col. 5, line 61-66). Further, Murphy *et al.* ('423) teach that said thermoplastic material is a powder (see col. 5, lines 48-50).

Regarding claim 11, Murphy *et al.* ('423) teach a hollow preform having a cylindrical sidewall and domed portions formed by winding a fiber around a liner. It is submitted that the resulting wall thickness varies along said vessel obtained by the process of Murphy *et al.* ('423) because both the liner and the wound layer in the process of Murphy *et al.* ('423) have a uniform thickness.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 3-9, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy *et al.* (US Patent No. 6,171,423 B1) in view of Wiltshire (US Patent No. 4,101,254).

Murphy *et al.* ('423) teach the basic claimed process as described above.

Regarding claims 3-7, although Murphy *et al.* ('423) teach a wide variety of methods of making said fiber preform including using chopped fiber (see col. 4, lines 64-67), Murphy *et al.* ('423) do not teach separately making the sidewall portion and the domed portions, that the sidewall portion overlaps the domed portions and, that said sidewall portion is made by rolling a fibrous mat. However, manufacturing a hollow reinforced plastic preform by separately manufacturing domed portions and a cylindrical portion by rolling a fibrous matt, is well known as evidenced by Wiltshire ('254) which teaches that in such a process an overlap results between the sidewall portion and the domed portions (see col. 1, lines 10-14 and 31-37). Therefore, it would have been obvious for one of ordinary skill in the art to have manufactured said hollow reinforced plastic preform by separately manufacturing domed portions and a cylindrical portion by rolling a fibrous matt and, overlapping cylindrical portion and domed portions as taught by Wiltshire ('254) in the process of Murphy *et al.* ('423) because Wiltshire ('254) teaches that such a process is well known, manufacturing simplicity, reduced production costs, reduced apparatus

costs, etc. and also because, Murphy *et al.* ('423) suggest making a preform using chopped fiber, whereas Wiltshire ('254) teaches a chopped fiber plastic preform.

In regard to claims 8-9, although Murphy *et al.* ('423) teach glass fibers and a thermoplastic resin, Murphy *et al.* ('423) do not teach that the ratio of reinforcing fiber to thermoplastic material is a constant value of 3:2. Wiltshire ('254) teaches a fibrous pressure vessel having a uniform fiber to resin ratio of 3:2 (see col. 2, lines 20-24). Therefore, it would have been obvious for one of ordinary skill in the art to have formed a fibrous pressure vessel having a uniform fiber to resin ratio of 3:2 as taught by Wiltshire ('254) using the process of Murphy *et al.* ('423) because, Wiltshire ('254) teaches that such a fiber to resin ratio provides for an improved pressure vessel, hence providing for improved product, whereas Murphy *et al.* ('423) teach a process for making a pressure vessel.

Specifically regarding claim 12, Wiltshire ('254) teaches overlapping cylindrical portion and domed portions. As such, it is submitted that the resulting wall thickness varies along said vessel obtained by the process of Murphy *et al.* ('423) in view of Wiltshire ('254) because of said overlap between said cylindrical portion and said domed portions.

9. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeBreton (US Patent No. 6,660,214 B2) in view of Wiltshire (US Patent No. 4,101,254).

LeBreton ('214) teaches the basic claimed process as described above.

Regarding claims 5-7, although LeBreton ('214) teach making said fiber preform using chopped fiber by separately making the sidewall portion and the domed portions, LeBreton ('214) does not teach that the sidewall portion overlaps the domed portions and that said sidewall portion is made by rolling a fibrous mat. Wiltshire ('254) teaches making a hollow reinforced

plastic preform by separately manufacturing domed portions and a cylindrical portion by rolling a fibrous matt. Further, Wiltshire ('254) teaches that in such a process an overlap results between the sidewall portion and the domed portions (see col. 1, lines 10-14 and 31-37). Therefore, it would have been obvious for one of ordinary skill in the art to have manufactured said hollow reinforced plastic preform by separately manufacturing domed portions and a cylindrical portion by rolling a fibrous matt and, overlapping cylindrical portion and domed portions as taught by Wiltshire ('254) in the process of LeBreton ('214) because Wiltshire ('254) teaches that such a process is well known, manufacturing simplicity, reduced production costs, reduced apparatus costs, etc. and also because, LeBreton ('214) teaches making a preform using chopped fiber, whereas Wiltshire ('254) teaches a chopped fiber plastic preform.

10. Claims 25-26, 30, 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeBreton (US Patent No. 6,660,214 B2) in view of Murphy *et al.* (US Patent No. 6,171,423 B1).

LeBreton ('214) teaches the basic claimed process as described above.

Regarding claims 25-26, 30, 32-34, LeBreton ('214) does not teach the use of a vacuum. Murphy *et al.* ('423) teach venting of a mold while molding a fiber reinforced thermopalstic vessel in order to permit trapped air to escape and hence, to avoid void formation (see col. 6, lines 33-38). Therefore, it would have been obvious for one of ordinary skill in the art to have provided venting of the mold as taught by Murphy *et al.* ('423) in the process LeBreton ('214) because, Murphy *et al.* ('423) teach that venting permits trapped air to escape and hence, to avoid void formation, hence providing for an improved product.

11. Claims 10, 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy *et al.* (US Patent No. 6,171,423 B1) in view of LeBreton (US Patent No. 6,660,214 B2).

Murphy *et al.* ('423) teach the basic claimed process as described above.

Regarding claim 10, Murphy *et al.* ('423) do not teach that the ratio of reinforcing fiber to thermoplastic material varies within said preform. LeBreton ('214) teaches that the ratio of reinforcing fiber to thermoplastic material varies throughout the preform depending on desired characteristics of the resulting article (see col. 3, lines 1-6). Therefore, it would have been obvious for one of ordinary skill in the art to have varied the ratio of reinforcing fiber to thermoplastic material throughout the preform as taught by LeBreton ('214) in the process of Murphy *et al.* ('423) because, LeBreton ('214) specifically teaches that the ratio of reinforcing fiber to thermoplastic material varies throughout the preform depending on desired characteristics of the resulting article, hence providing for an improved product.

In regard to claims 16-17, Murphy *et al.* ('423) do not teach at least partially bonding said bladder to the interior of said preform. LeBreton ('214) specifically teaches that it is well known to at least partially bond said bladder to said preform by treating said bladder with an adhesive agent (see col. 1, lines 43-48 and col. 4, lines 53-59). Therefore, it would have been obvious for one of ordinary skill in the art to have treated said bladder with an adhesive agent as taught by LeBreton ('214) in the process of Murphy *et al.* ('423) because, LeBreton ('214) specifically teaches that such bonding is well known depending on the functionality of the resulting product, hence providing for improved process versatility and product characteristics.

Specifically regarding claims 17-18, Murphy *et al.* ('423) do not teach at least partially releasing said bladder from the interior of said preform. LeBreton ('214) specifically teaches that it is well known to at least partially release said bladder to said preform by treating said bladder with a release agent (see col. 1, lines 43-48 and col. 4, lines 53-59). Therefore, it would have

been obvious for one of ordinary skill in the art to have treated said bladder with a release agent as taught by LeBreton ('214) in the process of Murphy *et al.* ('423) because, LeBreton ('214) specifically teaches that such releasing is well known depending on the functionality of the resulting product and it provides for reusability of said bladder, hence providing for improved process versatility and reduced production costs.

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy *et al.* (US Patent No. 6,171,423 B1) in view of Carter *et al.* (US 2003/0111473 A1).

Murphy *et al.* ('423) teach the basic claimed process as described above.

Regarding claim 14, although Murphy *et al.* ('423) teach chopped fiber, Murphy *et al.* ('423) do not teach specific fiber lengths. Carter *et al.* (US 2003/0111473 A1) teach a process for making a fiber reinforced composite pressure vessel using chopped fiber having a length of 0.5-3 inches (see paragraph [0065]). Therefore, it would have been obvious for one of ordinary skill in the art to have provided chopped fiber having a length of 0.5-3 inches as taught by Carter *et al.* (US 2003/0111473 A1) in the process of Murphy *et al.* ('423) because, Carter *et al.* (US 2003/0111473 A1) specifically teach that such a length provides for an improved pressure vessel, whereas Murphy *et al.* ('423) teach the use of chopped fiber in making a pressure vessel.

13. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy *et al.* (US Patent No. 6,171,423 B1) in view of Sandmark (US Patent no. 46,582,540 B1).

Murphy *et al.* ('423) teach the basic claimed process as described above.

Regarding claim 16, although Murphy *et al.* ('423) teach bonding of the liner (bladder) and the fiber reinforced thermoplastic material, Murphy *et al.* ('423) do not teach applying an adhesive to the bladder (liner). Sandmark ('540) teaches a process for making a fiber reinforced

pressure vessel including, applying an adhesive onto the liner in order to better improve the bonding characteristics between the liner and the fiber reinforced layer (see col. 4, lines 53-63). Therefore, it would have been obvious for one of ordinary skill in the art to have provided an adhesive layer between said bladder (liner) and said fiber reinforced layer as taught by Sandmark ('540) in the process of Murphy *et al.* ('423) because, Sandmark ('540) teaches that such an adhesive improves the bonding characteristics between the liner and the fiber reinforced layer, hence providing for an improved product and also because, Murphy *et al.* ('423) specifically teach an embodiment in which the liner (bladder)is bonded to the fiber reinforced thermoplastic material, hence teaching a desirability to use the inflatable bladder as the internal liner of the pressure vessel.

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy *et al.* (US Patent No. 6,171,423 B1) in view of Lankheet (US Patent no. 4,267,142).

Murphy *et al.* ('423) teach the basic claimed process as described above.

Regarding claim 18, although Murphy *et al.* ('423) teach removing said bladder after molding, Murphy *et al.* ('423) do not teach applying a mold release agent to said bladder. However, the use of a mold release agent is well known in the art as evidenced by Lankheet ('142) that teaches the use of a mold release agent to remove an elastic bladder (30) (see col. 5, lines 8-12). Therefore, it would have been obvious for one of ordinary skill in the art to have applied a mold release agent to said bladder as taught by Lankheet ('142) in the process of Murphy *et al.* ('423) because, Murphy *et al.* ('423) teach removing said bladder after molding, whereas Lankheet ('142) teaches that in order to remove an elastic bladder a mold release agent is required.

15. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy *et al.* (US Patent No. 6,171,423 B1) in view of Banchelin *et al.* (US Patent No. 5,814,268).

Murphy *et al.* ('423) teach the basic claimed process as described above.

Regarding claim 24, although Murphy *et al.* ('423) teach a silicone bladder, Murphy *et al.* ('423) do not teach a neoprene bladder. Banchelin *et al.* ('268) teach that silicone and neoprene bladders are equivalent alternatives for an inflatable bladder (see col. 4, lines 2-5). Therefore, it would have been obvious for one of ordinary skill in the art to have used a neoprene bladder as taught by Banchelin *et al.* ('268) as an equivalent alternative to a silicone bladder in the process of Murphy *et al.* ('423) because, Banchelin *et al.* ('268) specifically teach that silicone and neoprene bladders are equivalent alternatives for an inflatable bladder, whereas Murphy *et al.* ('423) teach a silicone bladder.

16. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy *et al.* (US Patent No. 6,171,423 B1) in view Reyes (US Patent No. 6,010, 411).

Murphy *et al.* ('423) teach the basic claimed process as described above.

Regarding claims 19-20, Murphy *et al.* ('423) does not teach specific molding conditions such as, molding temperature, time and pressure. It is noted that Murphy *et al.* ('423) teach that the heating process is determined such as to a temperature sufficient to melt said thermoplastic material and force said preform to conform to the inner surface of said mold (see col. 8, lines 25-30). Reyes ('411) teaches a process for molding a fiber reinforced thermoplastic hollow object using an inflatable bladder (col. 4, line 60 through col. 5, line 1). Further, Reyes ('411) teaches that the curing/solidification process is dependent on the molding time and temperature and, bladder pressure and as such, it is submitted that the molding time and temperature and, bladder

pressure are result effective-variables. In re Antonie, 59 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious to use routine experimentation to determine optimum levels for the molding time and temperature and, bladder pressure in the process of Murphy *et al.* ('423) in view of Reyes ('411) because, Reyes ('411) teaches that the curing/solidification process is dependent on the molding time and temperature and, bladder pressure and as such, it is submitted that the molding time and temperature and, bladder pressure are result effective-variables.

17. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy *et al.* (US Patent No. 6,171,423 B1) in view Reyes (US Patent No. 6,010, 411) and in further view of Carter *et al.* (US 2003/0111473 A1).

Murphy *et al.* ('423) in view of Reyes ('411) teach the basic claimed process as described above.

Regarding claim 22, although Murphy *et al.* ('423) in view of Reyes ('411) teach chopped fiber, Murphy *et al.* ('423) in view of Reyes ('411) do not teach specific fiber lengths. Carter *et al.* (US 2003/0111473 A1) teach a process for making a fiber reinforced composite pressure vessel using chopped fiber having a length of 0.5-3 inches (see paragraph [0065]). Therefore, it would have been obvious for one of ordinary skill in the art to have provided chopped fiber having a length of 0.5-3 inches as taught by Carter *et al.* (US 2003/0111473 A1) in the process of Murphy *et al.* ('423) in view of Reyes ('411) because, Carter *et al.* (US 2003/0111473 A1) specifically teach that such a length provides for an improved pressure vessel, whereas Murphy *et al.* ('423) teach the use of chopped fiber in making a pressure vessel.

18. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy *et al.* (US Patent No. 6,171,423 B1) in view of Wiltshire (US Patent No. 4,101,254) and in further view of Carter *et al.* (US 2003/0111473 A1) and Reyes (US Patent No. 6,010, 411).

Murphy *et al.* ('423) teach the basic claimed process as described above.

Regarding claim 31, although Murphy *et al.* ('423) teach glass fibers and thermoplastic fibers (see col. 5, lines 62-67), Murphy *et al.* ('423) do not teach that the ratio of reinforcing fiber to thermoplastic fibers is a constant value of 3:2. Wiltshire ('254) teaches a fibrous pressure vessel having a uniform fiber to resin ratio of 3:2 (see col. 2, lines 20-24). Therefore, it would have been obvious for one of ordinary skill in the art to have formed a fibrous pressure vessel having a uniform fiber to resin ratio of 3:2 as taught by Wiltshire ('254) using the process of Murphy *et al.* ('423) because, Wiltshire ('254) teaches that such a fiber to resin ratio provides for an improved pressure vessel, hence providing for improved product, whereas Murphy *et al.* ('423) teach a process for making a pressure vessel.

Further regarding claim 31, Murphy *et al.* ('423) in view of Wiltshire ('254) do not teach specific fiber lengths. Carter *et al.* (US 2003/0111473 A1) teach a process for making a fiber reinforced composite pressure vessel using chopped fiber having a length of 0.5-3 inches (see paragraph [0065]). Therefore, it would have been obvious for one of ordinary skill in the art to have provided chopped fiber having a length of 0.5-3 inches as taught by Carter *et al.* (US 2003/0111473 A1) in the process of Murphy *et al.* ('423) in view of Wiltshire ('254) because, Carter *et al.* (US 2003/0111473 A1) specifically teach that such a length provides for an improved pressure vessel, whereas Murphy *et al.* ('423) teach the use of chopped fiber in making a pressure vessel.

Further regarding claim 31, Murphy *et al.* ('423) in view of Wiltshire ('254) and in further view of Carter *et al.* (US 2003/0111473 A1) do not teach specific molding conditions such as, molding temperature, time and pressure. It is noted that Murphy *et al.* ('423) teach that the heating process is determined such as to a temperature sufficient to melt said thermoplastic material and force said preform to conform to the inner surface of said mold (see col. 8, lines 25-30). Reyes ('411) teaches a process for molding a fiber reinforced thermoplastic hollow object using an inflatable bladder (col. 4, line 60 through col. 5, line 1). Further, Reyes ('411) teaches that the curing/solidification process is dependent on the molding time and temperature and, bladder pressure and as such, it is submitted that the molding time and temperature and, bladder pressure are result effective-variables. In re Antonie, 59 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious to use routine experimentation to determine optimum levels for the molding time and temperature and, bladder pressure in the process of Murphy *et al.* ('423) in view of Wiltshire ('254) and in further view of Carter *et al.* (US 2003/0111473 A1) and Reyes ('411), because Reyes ('411) teaches that the curing/solidification process is dependent on the molding time and temperature and, bladder pressure and as such, it is submitted that the molding time and temperature and, bladder pressure are result effective-variables.

In regard to claim 32, Murphy *et al.* ('423) teach the use of vacuum while pressurizing said preform (see col. 9, lines 10-12).

19. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy *et al.* (US Patent No. 6,171,423 B1) in view of Wiltshire (US Patent No. 4,101,254) and in further view of Reyes (US Patent No. 6,010, 411).

Murphy *et al.* ('423) teach the basic claimed process as described above.

Regarding claim 33, although Murphy *et al.* ('423) teach a wide variety of methods of making said fiber preform including using chopped fiber (see col. 4, lines 64-67), Murphy *et al.* ('423) do not teach that the sidewall portion overlaps the domed portions and that said sidewall portion is made by rolling a fibrous mat. However, manufacturing a hollow reinforced plastic preform by separately manufacturing domed portions and a cylindrical portion by rolling a fibrous matt, is well known as evidenced by Wiltshire ('254) which teaches that in such a process an overlap results between the sidewall portion and the domed portions (see col. 1, lines 10-14 and 31-37). Therefore, it would have been obvious for one of ordinary skill in the art to have manufactured said hollow reinforced plastic preform by separately manufacturing domed portions and a cylindrical portion by rolling a fibrous matt and, overlapping cylindrical portion and domed portions as taught by Wiltshire ('254) in the process of Murphy *et al.* ('423) because Wiltshire ('254) teaches that such a process is well known, whereas Murphy *et al.* ('423) suggest making a preform using chopped fiber.

Further regarding claim 33, Murphy *et al.* ('423) in view of Wiltshire ('254) do not teach specific molding conditions such as, molding temperature, time and pressure. It is noted that Murphy *et al.* ('423) teach that the heating process is determined such as to a temperature sufficient to melt said thermoplastic material and force said preform to conform to the inner surface of said mold (see col. 8, lines 25-30). Reyes ('411) teaches a process for molding a fiber reinforced thermoplastic hollow object using an inflatable bladder (col. 4, line 60 through col. 5, line 1). Further, Reyes ('411) teaches that the curing/solidification process is dependent on the molding time and temperature and, bladder pressure and as such, it is submitted that the molding time and temperature and, bladder pressure are result effective-variables. In re Antonie, 59 F.2d

618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious to use routine experimentation to determine optimum levels for the molding time and temperature and, bladder pressure in the process of Murphy *et al.* ('423) in view of Wiltshire ('254) and in further view of Reyes ('411), because Reyes ('411) teaches that the curing/solidification process is dependent on the molding time and temperature and, bladder pressure and as such, it is submitted that the molding time and temperature and, bladder pressure are result effective-variables.

In regard to claim 34, Murphy *et al.* ('423) teach the use of vacuum while pressurizing said preform (see col. 9, lines 10-12).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (571) 272-1208. The examiner can normally be reached on Monday-Friday 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Stefan Staicovici, PhD

Primary Examiner 3/7/04

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